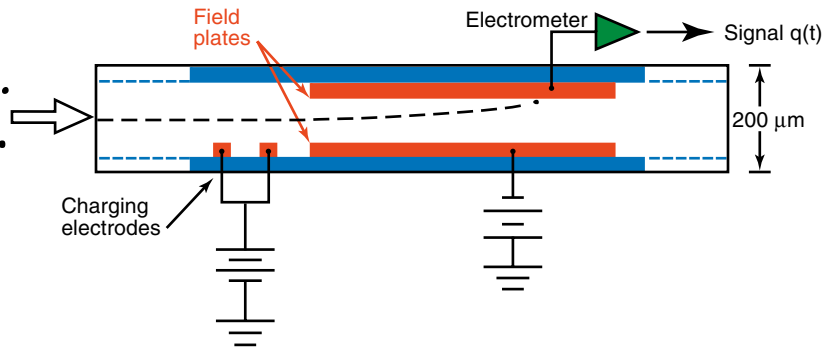
Microscale Particulate Classifier (MiPaC)

Physical Principals and Device Fabrication

- Measurement predicated on electrical mobility classification:
  - Drift of charge particles in an applied electric field
  - Particles possess known charge state as a function of size (charging mode)
  - Combination of operational modes permits classification of excess charge state, size distribution, and number density
- Device configuration, operation, and data analysis *well* understood:
  - Initial scaling of design for MEMS implementation completed
  - Microscale realization straightforward; *no* design or fabrication issues identified by CWRU or GRC



- Implemented a 3-wafer stack
  - Simplifies fabrication by restricting contact deposition to planar surface
- 4 Litho masks required for etching and contact deposition
- Commercial carrier and wire bonding provisions identified

- Options for multi-year program identified:
  - On-chip fabrication of electrometer
  - Inclusion of on board micro-rotor pump
  - Addition of optical MEMS for size, shape, and refractive index determination of particles > 1 μm
  - Microbalance for determination of mass loading and density